AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions, and listings, of claims in the above-identified patent application.

LISTING OF THE CLAIMS

1. (currently amended) A multi-state, multi-layer magnetic memory device, comprising:

a nonmagnetic spacer region with a surface ~~and an opposed surface~~; and

a free magnetic region positioned adjacent to the surface of the nonmagnetic spacer region, the free magnetic region including:

a first~~plurality of~~ magnetic layers having a first thickness; and

~~wherein~~ a second ~~free~~ magnetic layer positioned adjacent to ~~the surface of~~ the nonmagnetic spacer region ~~in the plurality of magnetic layers has improved material quality~~, the second magnetic layer having a second thickness that is greater than the first thickness.

2. (currently amended) A device as claimed in claim 1 wherein the second thickness ~~of the magnetic layer positioned adjacent to the surface of the nonmagnetic spacer region in the plurality of magnetic layers is in a range of approximately from~~ is greater than approximately 40 Å ~~to120 Å and the improved material quality is obtained through increasing the thickness~~.

3. (cancelled)

4. (currently amended) A device as claimed in claim 3 wherein the second magnetic layer ~~positioned adjacent to the surface of the nonmagnetic spacer region in the plurality of magnetic layers~~ is an amorphous magnetic alloy.

5. (cancelled)

6. (currently amended) A device as claimed in claim 1 wherein the free magnetic region includes ~~at least one layer of~~ an anti-ferromagnetic coupling spacer layer.

7. (currently amended) A device as claimed in claim 6 wherein the anti-ferromagnetic coupling spacer material includes at least one of copper (Cu), silver (Ag), gold (Au), chromium (Cr), ruthenium (Ru), rhenium (Re), osmium (Os), titanium (Ti), ~~chromium (Cr),~~ Rhodium (Rh), platinum (Pt), palladium (Pd), and alloys thereof.

8. (original) A device as claimed in claim 1 wherein the free magnetic region includes at least one of nickel (Ni), iron (Fe), cobalt (Co), manganese (Mn), combinations thereof, and alloys thereof.

9. (original) A device as claimed in claim 1 wherein the free magnetic region includes a synthetic anti-ferromagnetic material region including N ferromagnetic layers which are anti-ferromagnetically coupled where N is a whole number greater than or equal to two.

10. (currently amended) A device as claimed in claim 9 wherein each of the N ferromagnetic layers is anti-ferromagnetically coupled by sandwiching a layer of an anti-ferromagnetic coupling material between each adjacent ferromagnetic layer in the N ferromagnetic layers.

11. (currently amended) A device as claimed in claim 1 wherein a fixed magnetic region is positioned adjacent to a second surface ~~on the opposed surface~~ of the nonmagnetic spacer region.

12. (currently amended) A device as claimed in claim 1 wherein the nonmagnetic spacer region includes at least one of aluminum oxide (AlO), aluminum nitride (AlN), silicon oxide (SiO), ~~and another dielectric material which form a tunneling barrier with each adjacent region~~.

13. (original) A device as claimed in claim 1 wherein the nonmagnetic spacer is a conductive material including at least one of copper (Cu), chromium (Cr), silver (Ag), and gold (Au).

14. (currently amended) A device as claimed in claim 9 wherein ~~the~~ one of the N ferromagnetic layers of the synthetic anti-ferromagnetic material region that is positioned adjacent to the surface of the nonmagnetic spacer is at least as thick as any of the other N ferromagnetic layers which comprise the synthetic anti-ferromagnetic material region.

15. (cancelled)

16. (cancelled)

17. (cancelled)

18. (cancelled)

19. (cancelled)

20. (cancelled)

21. (cancelled)

22. (cancelled)

23. (cancelled)

24. (cancelled)

25. (cancelled)

26. (cancelled)

27. (cancelled)

28. (cancelled)

29. (cancelled)

30. (cancelled)

31. (cancelled)

32. (cancelled)

33. (new) A device as claimed in claim 2 wherein the second thickness is less than approximately 120 Å.